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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,159	05/05/2005	Jens-Peter Schlomka	PHDE020257US	9967

7590

11/06/2006

Philips Intellectual Property & Standards  
595 Miner Road  
Cleveland, OH 44143

EXAMINER

COCHRAN, ANTHONY K

ART UNIT

PAPER NUMBER

2112

DATE MAILED: 11/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/534,159

Applicant(s)

SCHLOMKA ET AL.

Examiner

Anthony Cochran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, and 5-7 is/are rejected.
- 7) ☒ Claim(s) 3 and 4 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Priority*

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. **DE-102 52 662.1**, filed on November 11, 2002.

### *Specification*

The disclosure is objected to because the specification refers to claims in the following sections, (**page 1, [0010]-[0014]**) which can create inconsistencies in the event of claims amendments. Appropriate correction replacing the references to claims in the specification is required.

The disclosure is objected to because there are no section headings in the specification. Note the following guidelines below. Appropriate correction is required.

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.

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- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Harding et al. (US 2002/0150202 A1).

Regarding **Claim 1**, Harding et al. discloses a computed tomography method comprising:

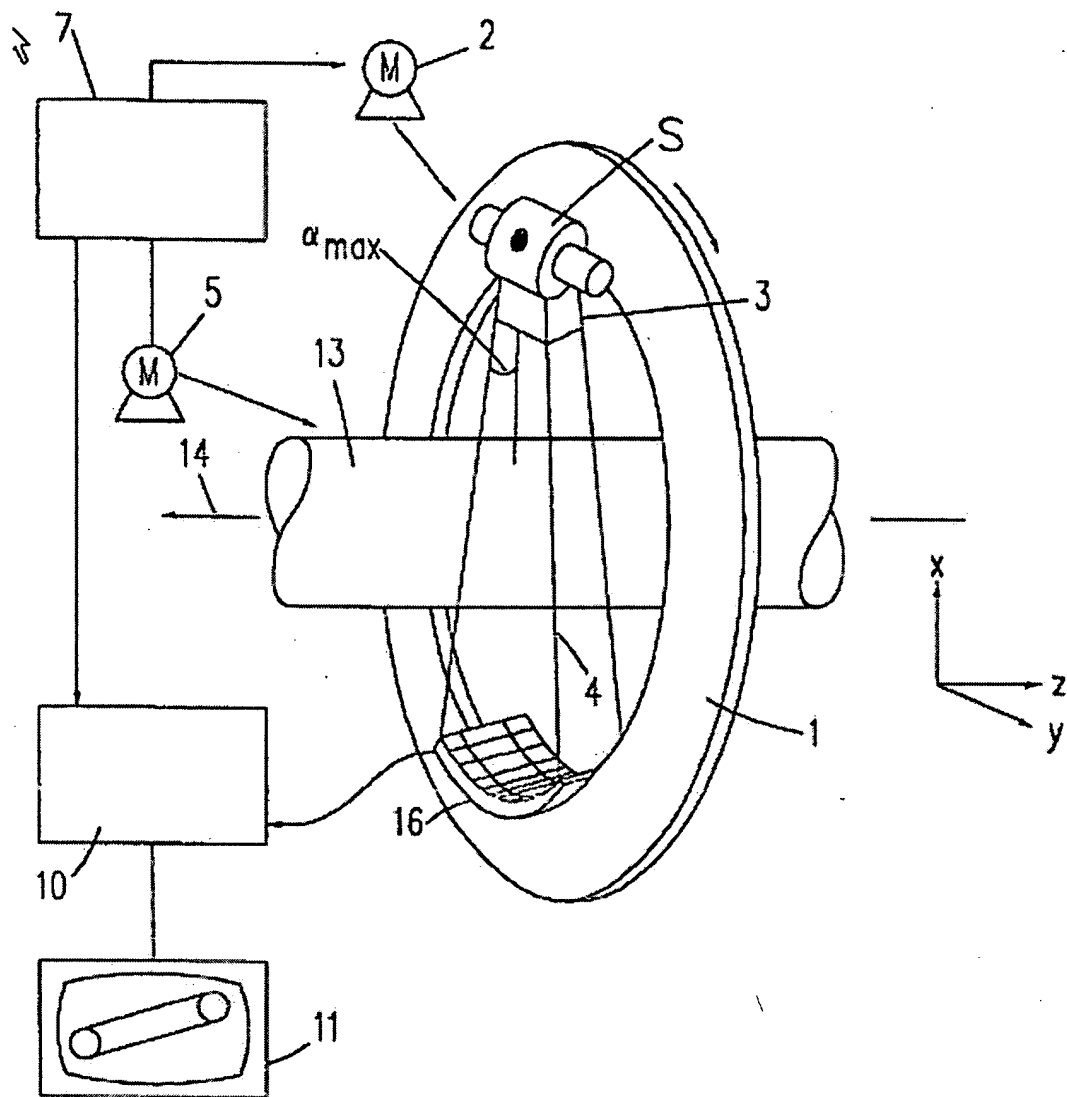
a) a radiation source and a diaphragm arrangement which is arranged between the examination zone and the radiation source, a fan beam which traverses an examination zone or an object present therein (Fig. 1 and [0020])

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b) rotation about an axis of rotation (14), between the radiation source on one side of the examination zone (**Fig. 1 and [0020]**).

c) measuring radiation intensity values by means of a detector (**[Fig 1 (D) and [0005]**).

d) reconstructing a CT image of the examination zone in a volume (**[0004 and 0023]**).



(Figure 1, Reproduced from US Pub. No. US 2002/0150202 A1)

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***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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**Claims 2 and 5-7** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Harding et. al. (US 2002/0150202 A1)** which has been described above in **Claim 1**, in view of **Grass et. al. (US 2001/0038678 A1)**.

With regards to **Claim 2**, **Harding et al.** teaches most of the elements of the claimed invention, but does not teach a reconstruction step performed along rays having a curved shape.

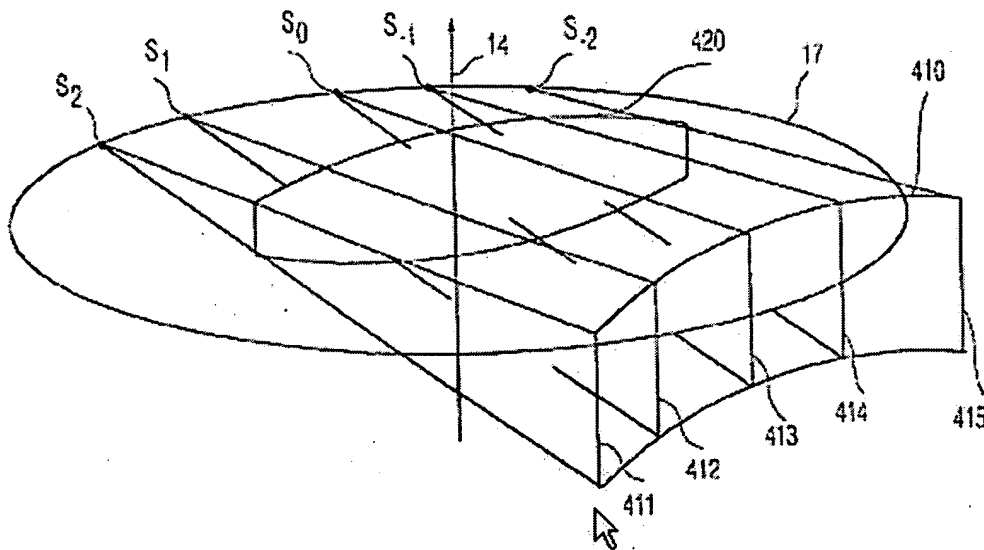
**Grass et. al.** disclose a CT reconstruction method for circular trajectories ([0017]). **Grass et. al.** goes on to cite that "This reconstruction method is known per se from German patent application . . . (PHD 98-123) or from the article by Gra.beta., Kohler, Proksa "3D cone-beam CT reconstruction for circular trajectories" in Phys. Med. Biol 45 (2000) 329-347." For details, see paragraph [0017] of **Grass et. al.**

It would have been obvious to and inherently necessary for one of ordinary skill in the art at the time of the invention to perform this reconstruction step in **Harding et. al.** in view of **Grass et. al.**, since as it appears notably from **FIG. 7** (see below), showing this region of intersection, the upper and lower edges (offset relative to one another in the direction of the axis of rotation) are curved. This curvature is due to the fact that the radiation source positions at the center (for example, S.sub.0) are situated further from the plane of intersection than the radiation source position at the edge (S.sub.2 or S.sub.-2) and that the fan beams all have the same angle of aperture, because the detector rows describe an arc of a circle around the radiation source S. In



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the case of a different geometry of the detector rows, the shape of the plane of intersection 420 would be different ([0053]).



(Figure 6, Reproduced from US Pub. No. US 2001/0038678 A1)

With regards to **Claim 5, Harding et al.** teaches most of the elements of the claimed invention, but does not teach a computed tomographic method with a reconstruction step comprising one-dimensional filtering, rebinning, and reconstruction of the measuring values.

Grass et. al. teaches a computed tomography method as claimed in claim 1, characterized in that the reconstruction includes the following steps:

a) rebinning the measuring data so as to form a number of groups, each group including a plurality of planes that extend parallel to one another and to the axis of rotation and contain a respective fan beam (411 . . . 415),

b) one-dimensional filtering of the data produced by the rebinning operation for each group in the direction perpendicular to the direction of the planes,

c) reconstructing the spatial distribution of the absorption by backprojection of the filtered data of a plurality of groups while taking into account filtered data from both trajectories for the backprojection in the intermediate region (Z). For details see page 6 of **Grass et. al. (US 2001/0038678 A1)**.

It would have been obvious to and inherently necessary for to one of ordinary skill in the art at the time the invention was made to use the teachings of **Grass et. al. in Harding et. al.** to include these steps in the reconstruction as being “fundamentally necessary” as stated in paragraph [0062] of **Grass et. al.**

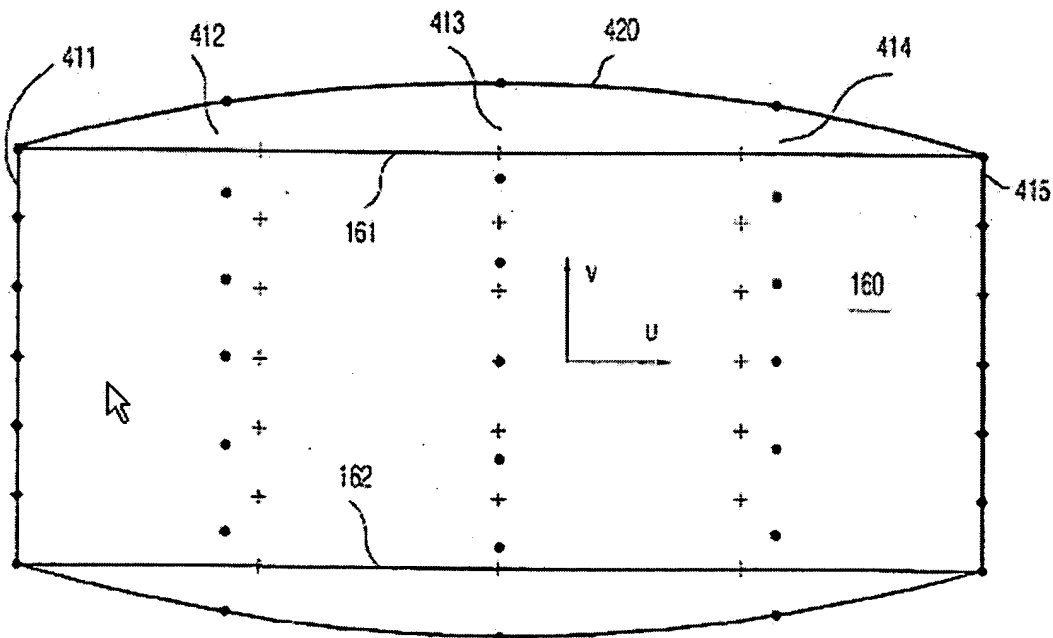


Figure 7, Reproduced from Grass et. al. (US 2001/0038678 A1)

With regards to **Claim 6, Harding et al.** teaches most of the elements of the claimed invention, but does not teach the tomographic apparatus.

**Grass et. al.** disclose (refer to Fig.1 above, [0029-0033], and claim 7) a radiation source (S) and diaphragm (collimator 3), detector unit (16) coupled to the radiation source (gantry 1), a drive arrangement (motors 2 and 5), reconstruction unit (10), and a control unit (7).

It would have been obvious for one of ordinary skill in the art at the time of the invention to build such an apparatus of of **Grass et. al. in Harding et. al.**, since it is the essential structure to carrying out the method of computed tomography as mentioned in paragraph [0006] of **Grass et. al.**

With regards to **Claim 7, Harding et al.** teaches most of the elements of the claimed invention, but does not teach a computer program for a control unit for controlling the tomographic apparatus.

**Grass et. al.** disclose a computer program for a control unit controlling a radiation source, diaphragm arrangement, drive arrangement and the reconstruction unit [0006 and Claim 7].

It would have been obvious for one of ordinary skill in the art at the time of the invention to produce such a computer program of **Grass et. al. in Harding et. al.**, since it is the essential sending instructions to the tomographic apparatus in order to carry out

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the method of computed tomography as mentioned in paragraph [0006] of Grass et. al.

### ***Allowable Subject Matter***

Claims 3 and 4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is the examiner's statement of reasons for allowance:

Per **Claim 3**, the computed tomography method as claimed in **Claim 1** requires that the measuring values are multiplied by a first weighting factor which corresponds to the square of the distance between the scatter center, at which the detected ray was scattered, and the point of incidence of the scattered ray on the detector unit, and by a second weighting factor which corresponds to the reciprocal value of the cosine of the scatter angle. **Claim 4** requires for said method that, prior to the back projection in the reconstruction step, all measuring values for each radiation source position are multiplied by a weighting factor which corresponds to the reciprocal value of the square of the distance between the radiation source position and the scatter center at which the detected ray was scattered. These features are neither shown nor fairly suggested in the prior art.

### ***Conclusion***

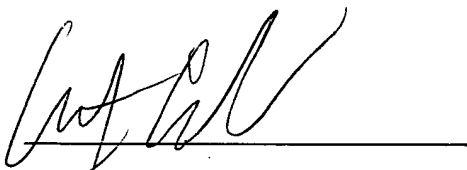
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Cochran whose telephone number is

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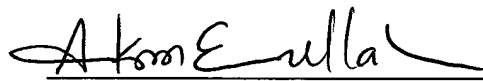
(571) 272-9794. The examiner can normally be reached on Monday - Friday from 8:00am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Akm Ullah, can be reached on (571) 272-2361. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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